Careers ln Marine Science

Introduction

So you want to be a Marine Scientist? You like to be outside, heard the oceans would feed the world, want to learn to SCUBA dive or communicate with dolphins. GREAT! You know what you like and have a direction in mind. But is Marine Science for you? What exactly does a marine scientist do and how do you enter the field.

Many people are asking these same questions. Interest in the ocean and the environment has sparked an increase in questions from students about careers in marine science. This publication will attempt to answer some of the commonly asked questions and help you learn more about this challenging field.

What does a Marine Scientist do?

More often, the question "Will I get to work with dolphins or whales?" is asked. The answer is probably not! Most people come into contact with marine animals at aquaria and theme parks, where they see some of the large, more glamorous animals that the seas have to offer. Television portrays marine biologists as divers searching for the mysteries of the deep or in a cage surrounded by sharks. The truth is that these are images of a small percentage of marine scientists.

South Carolina has many more people studying shrimp than dolphins or sharks. Some scientists venture out on large research vessels, sometimes for extended periods of time, while others study water samples in a laboratory. Many spend their day hip deep in marsh mud while still more perform research to help determine the laws and regulations necessary to protect the ocean's limited resources.

There are literally hundreds of different jobs in the field of Marine Science encompassing almost all other sciences: physics, chemistry and biology. Career choices are made as a result of interest or availability of employment.

Marine research, for example, often requires a boat ride, which may not be as glamorous as it sounds. Rough weather at sea, bobbing like a cork, and the associated sea sickness causes many would be marine scientists to consider other less "rolling" careers.

Field work, which can be a day spent sampling in a salt marsh or weeks spent at sea, requires physical strength and a positive attitude about being covered with marsh mud, mosquitoes or fish slime. You may be asked to work around the clock while gathering specimens.

You survive the field work, or "fun" part, and return to the lab to process your data (you and a computer) and analyze it (you and math). Lab and office work may become routine and tedious when sorting samples or doing repetitive testing, but this is the real "work" in most scientific fields.

So now you're asking, "Why would anyone want to do this?" Marine science can also be very rewarding. Pleasant weather, the challenge and satisfaction of understanding and bettering the environment and the sunrise over the ocean are also part of the job. Remember that while research may not be for you, there are many related jobs to consider. Education, environmental law, interpretation, art, journalism and many other non-scientific fields offer a chance to work with marine related topics.

What are the Educational Requirements?

Qualities such as an inquisitive mind and the determination to persevere despite many obstacles could contribute to the success of prospective marine scientists. Many interested students are eager to start research, dive in submersibles and swim with man-eating sharks, but you will need a good

educational background first.

Research should be communicated to other scientists and the general public so that the findings can be put to use. For this reason, marine scientists need communication skills, which include public speaking (to give lectures) and writing (to write scientific papers and grants for funding).

Communications may also encompass use of computers and software programs to prepare papers and analyze data. So, you can see that a good educational background includes more than just science.

Marine science is a popular field. Students who aim for scientific careers have to strive to be the best in their academic endeavors because only good and enthusiastic students are chosen. Good study habits should be developed in elementary school, since this will prepare a student for a successful career.

Academic preparation will include doing well in a pre-college program in high school with a very solid background in mathematics, physics, chemistry, biology, computers, English, etc.

Technical positions exist within the marine field for high school graduates, but salaries are relatively low. With a college degree (four years of hard work), one can be a professional marine scientist working in the more attractive, "hands-on" areas, providing support on various research projects.

A strong and broad background in the sciences through undergraduate college is essential for understanding the complexities of oceanic or biological systems. This also enables you to interact with scientists of other disciplines and communicate important findings to resource managers, politicians and the public.

A bachelor's degree is required for most entry level positions, while more advanced degrees are required for upper level jobs. Simply completing a degree may not be enough. The job market is competitive, so grades are important and will be considered by employers.

If you are still determined and of high spirit about contributing toward understanding regional or global problems of pollution, overfishing, habitat restoration, coastal human populations, global climate change, etc., then you have decided to accept the challenge. Now, you must set some educational and experience goals and begin to focus your efforts.

Focusing on a specific area may start as early as college where your interest or proficiency in statistics, biology, geology, chemistry, etc. may translate into a "major" area of study. Further specialization in one area of marine science requires graduate, and often, post-graduate training in one or several areas. This additional educational requirement could take 2-6 years, depending on the contribution a person would like to make to the development of this relatively "young" science.

Due to the present popularity of marine science and the general decrease in the rate of expansion of

funding for this field, competition for professional positions is stiff, often requiring students to complete 1-2 years of training beyond a Ph.D. to locate a good career position.

You now may realize that your education can take 10-12 years beyond high school prior to employment. Marine Scientists Many universities and affiliated institutions offer teaching or research assistantships for graduate students which not only provide financial support but also provide valuable experience in the field. The positive side is that as you specialize and gain experience, you are working in an exciting field of your choice.

What is the Job Market Like for Marine Science?

Although the relative funding for science is not what it was in the 1970s, many good positions are and will be available in both government and industry. Good marine, estuarine and environmental scientists with a number of grants and publications will continue to be in demand, but tight funding may cause the competitive emphasis to be placed upon the word "good."

The opportunities that exist for a well-trained individual are in every branch of marine scientist. Many students are excited about pursuing those areas with the most potential for assisting society and protecting the marine environment.

Coastal development has risen sharply in recent years and governments are trying to minimize environmental impacts resulting from this growth. Human populations and the associated problems continue to increase in areas where the land meets the sea. For this reason, planning jobs and coastal zone management jobs may be an increasing source of future employment.

More jobs are becoming available in the private sector as well. Concern for the environment is growing and there is an increasing demand for environmental impact studies. Environmental consulting firms are filling this need and creating jobs.

Ecotourism may also offer oppurtunities for future employment. Nature-based tourism firms are searching for qualified interpreters to teach the public about the natural and marine environments. Teaching positions are occasionally available at colleges and universities, but these are scarce and competitive.

Jobs will be available, but job seekers must be prepared to interview many times and be willing to relocate to a different part of the country. Certain parts of the country may have more marine opportunities available than other parts. While the number of jobs may be increasing in certain areas of marine science, you should remember that there are a lot of eager, talented job seekers as well.

What is the Salary for a Marine Scientist?

This is a difficult question. As in business, there are entry level, middle and advanced positions. Salaries also vary from state to state and between the government and private companies.

In general, marine biologists are not paid as well as doctors or lawyers, but a comfortable living can be obtained. Higher salaries generally can be found in the private sector. As with any occupation, earnings vary with education, experience and responsibilities.

Will I be Helping the Environment?

To some, a rewarding application of marine science would be in the saving of biological communities and their habitats, which have been losing ground to encroaching coastal development.

Marine scientists are actively helping the environment by working to ensure that ocean resources will be available in the future and to increase mankind's understanding of marine life, communities and processes.

Marine biologists often work with animals that are caught for food or pleasure and may need some protection from over exploitation. Other marine scientists use their expertise to lessen the effects of environmental disasters such as oil spills or fish kills.

Mariculture, the process of raising marine animals for food, may help relieve the pressure on limited ocean resources. Volunteer organizations, such as the Peace Corps, teach people how to raise marine animals for food. These efforts may help reduce fishing pressure on wild populations, and provide a reliable source of nourishment.

How can I Get Further Information?

So, where do you start? Start by asking questions. Make a list of questions about the oceans or marine life that interest you. Then, (this is where the work comes in) try to answer your own questions by "library research," viewing videos and writing to experts. You will learn a lot about marine science opportunities.

One way to continue your interest in the study of the sea and marine life is to learn what new discoveries are being made in the field. This can be done by subscribing to oceanographic oriented

magazines. We have listed three at the end of this publication. If you can not afford these, they may be available in your local library.

A career in marine science may be different from what most people expect. A person entering this field may not work with dolphins and whales, but may still have a challenging and rewarding job. If you love the sea, enjoy solving problems, have good grades in science and math and possess both patience and perseverance, then a career in marine science may be for you.

Interesting Reading

"*Currents*" or "*Ocean Explorer*,"
Associates Office, Woods Hole Oceanographic Institution
Woods Hole, MA 02543

"Sea Frontiers"
P.O. Box 498
Mount Morris, IL 61054-8003

DNR Mission Statement

The South Carolina Department of Natural Resources is the advocate for and steward of the state's natural resources. The Department of Natural Resources develops and implements policies and programs for the conservation, management, utilization and protection of the state's natural resources based upon scientifically sound resource assessment and monitoring, applied research, technology transfer, comprehensive planning, public education, technical assistance and constituent involvement. The Department of Natural Resources is pro-active in protecting the state's natural resources for use and enjoyment by future generations of South Carolinians.

Special Note

This publication was made possible in part with funds from the sale of the South Carolina Marine Recreational Fisheries Stamp. Help ensure outdoor enjoyment for future generations by strictly adhering to all rules, regulations, seasons, catch limits and size limits. The South Carolina Department of Natural Resources publishes an annual Rules and Regulations booklet that lists all saltwater fishing regulations. Have an enjoyable fishing trip by reading these requirements before you fish.

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Saltwater Fishing

Conservation & Ethics

Although most people once considered ocean resources to be unlimited, recent rapid declines in the populations of many commercial and recreational species have demonstrated the opposite.

Numerous types of saltwater game fish now are being over harvested and other species will face a similar fate unless all anglers practice wise conservation and adopt an ethical approach to fishing.

Size and catch limits, seasons and gear restrictions should be adhered to strictly. These regulations change from time to time as managers learn more about fish life histories and how to provide angling opportunities without depleting stocks.

The challenge of catching, not killing fish, provides anglers with the excitement and the reward of fishing. Undersized fish, or fish over the limit should be released to ensure the future of fish populations. The number of saltwater finfish tagged and released annually in South Carolina has increased significantly in recent years as more and more fishermen take up this practice that provides information on growth and movement of fish as well as conserving resources.

Saltwater fishermen can further contribute to conservation by purchasing a Marine Recreational Fisheries Stamp which is required to fish from a private boat or gather shellfish in South Carolina's saltwaters. Funds generated by the sale of stamps must be spent on programs that directly benefit saltwater fish, shellfish and fishermen.